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JAKARTA SOCIO-CULTURAL ECOLOGY: A SUSTAINABLE ARCHITECTURE CONCEPT IN URBAN NEIGHBOURHOOD

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Jakarta socio-cultural ecology: A sustainable architecture concept in urban neighbourhood

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Abstract

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As a metropolitan city with densely populated and fast residential development Jakarta should be able to implement a concept that is Jakarta socio-cultural ecology Architecture as the basis of settlement development. The concept of Jakarta socio-cultural ecology architecture is characterized by residential development capabilities that reflect and express the indigenous culture, the settlements built by linking the social and economic activities of the people of Jakarta and the settlements built by maintaining the building with the value of existing heritage. The objectives of this research are 1) to find a relevant construct to housing condition in Jakarta which then called Jakarta socio-cultural ecology, and 2) to see the tendency of complex condition of Jakarta socio-cultural ecology settlement. This research uses Neuroresearch method, which is one of mix-method research method as a mixture research method between qualitative research (exploration) and quantitative research method (explanatory and confirmatory). The population of research as well as unit analysis are all settlements in Jakarta. Sampling technique using probability sampling that is with multistage sampling. The results show that nowadays the Jakarta residential complex tends to lead to socio-cultural ecology and rather reflects and expresses the indigenous culture, the residential complex in Jakarta tends to form the building has been linked fully with the social and economic activities of Jakarta society but tends to occasionally maintain buildings with existing heritage values. This study also found that indigenous culture is a significant determinant of the formation of the condition of Jakarta socio-cultural ecology. © 2017 Published under licence by IOP Publishing Ltd.

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Jakarta socio-cultural ecology: a sustainable architecture concept in urban neighbourhood

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Abstract. As a metropolitan city with densely populated and fast residential development Jakarta should be able to implement a concept that is Jakarta socio-cultural ecology Architecture as the basis of settlement development. The concept of Jakarta socio-cultural ecology architecture is characterized by residential development capabilities that reflect and express the indigenous culture, the settlements built by linking the social and economic activities of the people of Jakarta and the settlements built by maintaining the building with the value of existing heritage. The objectives of this research are 1) to find a relevant construct to housing condition in Jakarta which then called Jakarta socio-cultural ecology, and 2) to see the tendency of complex condition of Jakarta socio-cultural ecology settlement. This research uses Neuroresearch method, which is one of mix-method research method as a mixture research method between qualitative research (exploration) and quantitative research method (explanatory and confirmatory). The population of research as well as unit analysis are all settlements in Jakarta. Sampling technique using probability sampling that is with multistage sampling. The results show that nowadays the Jakarta residential complex tends to lead to socio-cultural ecology and rather reflects and expresses the indigenous culture, the residential complex in Jakarta tends to form the building has been linked fully with the social and economic activities of Jakarta society but tends to occasionally maintain buildings with existing heritage values. This study also found that indigenous culture is a significant determinant of the formation of the condition of Jakarta socio-cultural ecology.

Keywords: socio-cultural ecology, sustainable architecture, urban neighbourhood, sustainable settlement.

1. Introduction

Jakarta is a metropolitan city in Indonesia that has a diversity of population as diverse as the Indonesian archipelago that consists of various cultural tribes. Various ethnic, cultural, dialect and religions that come from various corners of the archipelago even from abroad gathered in this city [1]. As a capital city, Jakarta is a city that holds national culture as well as international culture. As a metropolis, Jakarta should be able to develop city management that ensures a sustainable economic, social, political and environmental balance and quality of life [2].



1

The growth of Jakarta before becoming a metropolitan city was preceded by indigenous people, indigenous culture, and original character. Along with the development of the era, Jakarta continues to grow and become a settlement that grows so extraordinary. Rapid changes occurred as Indonesia entered the reform era, where opportunities existed for governments and the private sector to participate in industry development so as to transform the metropolitan city more creatively [3].

As a cultured nation, it is impossible for a community to cut the culture of the local community because local wisdom is also a key to regional progress [4], [5]. So even though an area develops into a metropolitan city, cultural characteristics should still colour the regional cultural products that can be realized one of them through the typical building as a form of rapid expansion of the city [6]. In addition to local wisdom, the progress of the community, settlements, and buildings must also pay attention to various aspects that characterize modern culture, namely aspects of ecology and social aspects. This is based on efforts to preserve the environment and sustainable environment.

Jakarta is now characterized by the development of settlements growing in various corners of the capital because as a metropolitan city Jakarta has a densely populated city so it needs the development of settlements to meet the needs of residences in Jakarta. The suburban structure of Jakarta has been transformed into urban activity thus creating a common space of segregation that turns rural into small settlements and then raises the development of trade and services along the way [7], [8]. Residential development is carried out by various developers with good intentions to invest, earn profits and meet the needs of the community for the comfort of a modern and environmentally friendly dwelling [9].

A paradigm shift is required as a basic concept in a housing development. If the region is stronger in developing local wisdom so that the shift of modernity is marked by the strength of cultural values so that the concept of housing retains the characteristics of local cultural traditions, then the shift of modernity in big cities, especially the capital more leads to the shift from local to international culture. One of the concepts suitable for settlement in Jakarta should be able to synergize the community with all its infrastructure with social harmony, harmony with local culture, national and international as well as harmony with the environment. Land suitability analysis is also needed as a basis for developing the concept of this settlement [10]. Thus, the concept of green settlement is the end product of residential development in Jakarta. This phenomenon makes Jakarta able to be a representation of the shift of settlement that relies on local culture to the modern culture which in this research called Socio-cultural ecology. The three aspects that become the foundation in development in various countries because these three aspects have a goal to improve the welfare of society. In this research, the meaning of Jakarta socio-cultural-ecology is the concept of sustainable architecture in Jakarta urban settlement that prioritizes social aspect, considering local culture wisdom and paying attention to environmental carrying capacity. The problem statement for the research is 1) how the constructs are relevant to the housing conditions in Jakarta which is then called Jakarta socio-cultural ecology? and 2) how the tendency of the complex condition of the Socio-cultural ecology settlement of Jakarta?.

2. Research Framework

The concept of Jakarta socio-cultural ecology is focused on residential complexes where residential development is one of the fastest developments in Jakarta. This concept is directed at a new paradigm where in developing the settlement must consider three things namely

- (a). The settlement is able to reflect and express the original culture. This dimension is characterized by several indicators in developing residential developers using materials sourced from local wisdom, designing building construction based on the expression of a local skill, adapting based on the characteristics of old buildings and maintaining the scale and typology of the original building. However, in this plural society, there is no assumption that community groups should be absorbed and assimilated by other groups so that culture is not viewed in a mutually beneficial direction [11].
- (b). The settlement was built by linking the social and economic activities of the people of Jakarta. This dimension is characterized by indicators how to maintain the existing spatial mix for living,

- 1 trading and social activities and emphasizing public space. This is because with the improvement of this governance will also have an impact on social activities and national economic growth with the population in it [12].
- (c). The settlement is built by maintaining the building with the value of existing heritage. This dimension has two indicators: how to respect the local context and how to use existing buildings rather than build on the new land.

Nevertheless, this study also includes various variables that have an influence in realizing Jakarta socio-cultural ecology in the residential complex, i.e. number of houses, home status, type of building and type of occupant institution.



Figure 1. Paradigm Research Jakarta Social-Cultural Ecology

1

3. Materials and methods

This research uses Neuro research method, which is one of mix-method research method as a mixed research method between qualitative research (exploration) and quantitative research method (explanatory and confirmatory [13]- [15]. Exploratory research is a theoretical study through content analysis until the theoretical construct discovery of Jakarta socio-cultural ecology as a means of improving the quality of life of the people of Jakarta. Theoretical construct is the final conclusion of the theoretical study of the "Jakarta socio-cultural ecology" variable as a means of improving the quality of life of the Jakarta community "inspired by the results of prior research which is then contextualized to the research population that is relevant in Jakarta. The results of this exploratory research in the form of conceptual definition, dimensions and indicators. In Neuroresearch, a theoretical construct is an academic prediction that must be proven through instrument calibration (construct validity) and prove it in the field through surveys [15], [16]. And the next stage is the stage of quantitative research called exploratory and confirmatory research. Explanatory research stage is the stage of survey research to test in research samples and compare based on different categories of respondent background which then called confirmatory research.

The population of research as well as unit analysis are all settlements in Jakarta. Sampling technique using probability sampling that is with multistage sampling [17], [18]. Sampling steps: First, establish clusters to establish two areas of residential complexes of South and West Jakarta. Second, based on two clusters then selected sample of 52 complexes of settlement. Data collection techniques with rating sheets rated scale 1 to 5 as much as 50 grains. Sources of data as assessors of each residential complex are three senior students of the Department of Architecture Bina Nusantara University. The validity of the Jakarta socio-cultural ecology assessment sheet is done by 2 stages through content validity through expert judgment. Medium construct validity assessment sheet by way of trials to 20 residential complexes, each residential is also assessed by 3 senior students majoring in Architecture Bina Nusantara University. The construct validity scoring approach was conducted by Item Response Theory (IRT) through an Orthogonal Iteration (Pearson) r-criterion of 0.444 because the researcher believes that the Jakarta socio-cultural ecology is a unidimensional concept. The Reliability Index calculation using Cronbach Alpha Formula.

4. Results and discussions

4.1. Calibration of Jakarta Socio-Cultural Ecology Instruments

The initial instrument of the Jakarta socio-cultural ecology variable uses 50 items spread across 3 dimensions and 8 indicators. Based on the first Orthogonal Iteration calculation, 31 items are valid but 31 items are dropped. Therefore, it must be recalculated until simultaneously find all the valid items. The second orthogonal Iteration calculation produces 25 items of valid grain, but there are still dropped items. The calculation of the third Orthogonal Iteration produces 24 items of valid grain, but there are still dropped items. The fourth Orthogonal Iteration calculation produces 23 items of valid grain, but there are still dropped items. The fifth Orthogonal Iteration calculation produces 22 items of valid grains, and all items are valid at the same time and all indicators and dimensions are represented at least one item. So, the instrument (assessment sheet) of Jakarta socio-cultural ecology variables can be said as "valid instrument" with only 22 items with Reliability Index of 0.948.

Instrumentation calibration of Jakarta socio-cultural ecology assessment sheet in the form of construct validity can be seen in table 1 below.

1

Table 1. Construct validity result of variable assessment sheet Jakarta socio-cultural ecology with item Response Theory through Orthogonal Iteration (Pearson Formula)

No	Dimension	Indicator	Planned Number	Valid Items Based on Orthogonal Iterations to:					
			Item by Content Validity	1	2	3	4	5	6 (Final Items)
A.	Reflect and Express the original culture	Using materials sourced from local wisdom	1, 10, 13, 33, 35, 40,	1, 10, 33	1, 10, 33	1, 10, 33	1, 10, 33	1, 10	1, 10
		Designing building construction based on the expression of a local skill	2, 12, 14, 20, 24, 30, 39, 41, 42, 49, 50	2, 14, 20, 24, 30, 39, 41, 49, 50	2, 14, 20, 39, 41, 49	2, 14, 39, 41, 49	2, 14, 39, 41, 49	2, 14, 39, 41, 49	2, 14, 39, 41, 49
		Adaptation based on the characteristics of the old building	4, 5, 29, 36, 44,	4, 5, 29	4, 5	4, 5	4, 5	4, 5	4, 5
		Maintains the scale and typology of the original building	6, 17, 25, 26, 34, 45, 46,	6, 17, 25, 45, 46	6, 17, 25, 45,	6, 17, 25, 45,	6, 17, 25, 45,	6, 17, 25, 45,	6, 17, 25, 45, 46
B.	The form was built by linking the social and economic activities of the people of Jakarta	Maintain the integration of existing space for life, commerce and social activities	3, 11, 15, 43,	11, 15	15	15	15	15	15
		Emphasize public space	7, 8, 16, 18, 37,	8, 18,	8, 18,	8, 18,	8, 18,	8, 18,	8, 18,
		Respect the local context	38, 47, 48,	48	48	48	48	48	48
		Utilizing existing buildings rather than building new land	9, 21, 27, 28,	9, 21,	9, 28	9, 28	28	28	28
C.	Maintain buildings with existing heritage values	Utilizing existing buildings rather than building new land	23,	23, 22, 32	23, 22,	23, 22,	23, 22,	23, 22,	23, 22, 32
		Number of Valid Items	50	31	25	24	23	22	22

4. 2 Research result

Research Results 1: Exploratory research on the condition of Jakarta socio-cultural ecology - a Neuro research study on housing improving the quality of life of Jakarta society.

The result of this research is to produce a construct relevant to housing condition in Jakarta which then called Jakarta socio-cultural ecology. The result of this research is the result of exploratory research which is various literature study to find that what is meant by Jakarta socio-cultural ecology is a contextual settlement with Jakarta condition that reflects and expresses the original culture, the form of the building always connects with social activity and its architecture maintains the values the value of existing inheritance.

Research Result 2 (Explanatory Research)

Explanatory stage resulted analysis of analysis of 6 (six) proposed hypothesis, that is:

Hypothesis 1: What is the trend of the socio-cultural ecology condition of the Jakarta settlement complex?

1 **Table 2.** Results of Hypothesis analysis 1

Variable Trends	Lower Bound	Upper Bound	Range	Min	Max	Conclusion
Jakarta socio-cultural ecology	67.2567	73.5702	48.67	46	94.67	The residential complex in Jakarta tends to lead to socio-cultural ecology significantly at $\alpha < 0.05$.

To prove the condition of the complex of the socio-cultural ecology settlement of Jakarta, the researcher, in this case, establishes 3 (three) categories of assessment: (a) not socio-cultural ecology, (b) rather socio-cultural ecology, and (c) socio-cultural ecology. Data analysis was done with a confidence interval at significance level 5% and produced lower and upper boundary between 67.2567 up to 73.5702. Based on these results, it can be concluded that Jakarta residential complex tends to lead to socio-cultural ecology significantly on $\alpha < 0.05$.

Hypothesis 2: What is the tendency of the condition of Jakarta's settlement complex in reflecting and expressing indigenous culture?

Table 3. Results of Hypothesis analysis 2

Dimension Trends	Lower Bound	Upper Bound	Range	Min	Max	Conclusion
Reflect and Express Indigenous Cultures	42.7466	46.8752	31	27.67	58.67	The residential complex in Jakarta tends to somewhat reflect and somewhat express the indigenous culture significantly at $\alpha < 0.05$.

To prove the tendency of the condition of the Jakarta Settlement complex in terms of reflecting and expressing indigenous culture (X1), the researcher in this case establishes 3 (three) rating categories: (a) does not reflect and express the original culture, (b) rather reflect and not express indigenous cultures, and (c) reflect and not express indigenous cultures. Data analysis was done with a confidence interval at 5% significance level and produced lower and upper bound between 42.7466 up to 46.8752. Based on these results, it can be concluded that the residential complex in Jakarta tends to somewhat reflect and rather express the original culture significantly at $\alpha < 0.05$.

Hypothesis 3: How is the tendency of complex condition of Jakarta Settlement related to its form built by linking social and economic activities of Jakarta Society?

Table 4. Results of Hypothesis Analysis 3

Dimension Trends	Lower Bound	Upper Bound	Range	Min	Max	Conclusion
The form was built by linking the social and economic activities of the people of Jakarta	12.6847	14.1358	11.33	7.33	18.67	The residential complex in Jakarta tends to shape has begun to relate to the social and economic activities of the people of Jakarta significantly at $\alpha < 0.05$.

In proving the tendency of the condition of the Jakarta Settlement Complex in relation to the shape constructed by linking the social and economic activities of the people of Jakarta (X2), the researcher in this case establishes 3 (three) rating categories: (a) the building form does not relate to the social and economic activities of the community Jakarta, (b) the form of the building is somewhat related to the social and economic activities of the people of Jakarta, and (c) the building form attributes fully to the

1 social and economic activities of the Jakarta community. Data analysis was done with a confidence interval at significance level 5% and produced lower and upper bound between 12.6847 up to 14.1358. Based on these results, it can be concluded that the residential complex in Jakarta tends to form the structure has been linked fully with the social and economic activities of the people of Jakarta significantly at $\alpha < 0.05$.

Hypothesis 4: What is the Tendency of the Condition of Jakarta's Settlement Complex in Maintaining Buildings with Inherited Values?

Table 5. Results of Hypothesis Analysis 4

Dimension Trends		Lower Bound	Upper Bound	Range	Min	Max	Conclusion
Maintain buildings with existing heritage values	with	11.5872	12.7975	9	8.33	17.33	The residential complex in Jakarta tends to occasionally defend buildings with significant heritage values at $\alpha < 0.05$.

To prove the tendency of the condition of the Jakarta Settlement Complex in terms of Maintaining the Building with the Inheritance Values (X3), the researcher in this case establishes 3 (three) rating categories: (a) the building form does not preserve the inheritance values, b) sometimes the form of the building preserves the inheritance values, and (c) the form of the building preserves the inheritance values. Data analysis was done with a confidence interval at 5% significance level and produced lower and upper bound between 11.5872 up to 12.7975. Based on these results, it can be concluded that the residential complex in Jakarta tends to occasionally retain buildings with significant heritage values at $\alpha < 0.05$.

Hypothesis 5: Settlements that reflect and express Indigenous cultures are crucial to the realization of socio-cultural ecology in the Settlement Complex in Jakarta.

This analytical approach is defined by a Binary Segmentation called Classification and Regression Trees. In this analysis, the researchers set the Pruning of Depth by 2; Parent of 2; and Child equal to 1, with significance level $\alpha < 0.05$. Summary of the results as follows.

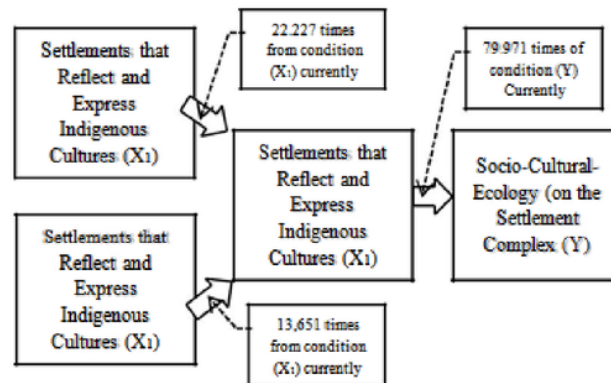


Figure 2. Results of Binary segmentation analysis

The result of the analysis shows that Jakarta residential complex that reflects and express original culture (X2) is a significant determinant of the condition of Jakarta Socio-Cultural Ecology (Y). The more complex the residential complex in Jakarta will be improved by the way the design reflects the original culture, then the condition of the Socio-Cultural-Ecology settlement in Jakarta will be realized (22.227 + 13.651 + 79.971) that is 115,849 times from the current condition.

1
Hypothesis 6: Is there a Different Socio-Cultural-Ecology Condition in the Settlement Complex in Jakarta, if differentiated by House Type (X_{12}) category, Economic Status of Housing (X_{13}), Building Type (X_{14}), and Housing Type Based on Occupant Institution (X_{15})?

- (a). Settlements with less than 100 units of housing units or 100-300 units or above 300 units are equally likely to be somewhat Socio-Cultural-Ecology significantly at $\alpha < 0.05$.
- (b). Upper and intermediate settlements are equally likely to be somewhat Socio-Cultural-Ecology significantly at $\alpha < 0.05$.
- (c). Settlements whose inhabitants come from formal institutions that are either active or non-active in work and those whose settlements are informal are equally likely to be somewhat Socio-Cultural Ecology significantly at $\alpha < 0.05$.
- (d). Residential type homogenous (homogeneous) conditions are somewhat Socio-Cultural Ecology, whereas residential homes are diverse (heterogeneous) not Socio-Cultural Ecology significantly at $\alpha < 0.05$.

5. Conclusion

Jakarta socio-cultural ecology is a concept for the contextual settlement with Jakarta condition that reflects and expresses the original culture, the form of the building always connects with the social activity and its architecture maintains the values of the existing heritage. Today the Jakarta residential complex tends to be somewhat oriented towards socio-cultural ecology and rather reflects and expresses the indigenous culture.

The result of the research shows that residential complex in Jakarta tends to form the building has been linked fully with a social and economic activity of Jakarta society but tends to occasionally maintain the building with heritage values. This study also found that indigenous culture is a significant determinant of the formation of the condition of Jakarta socio-cultural ecology.

Therefore, it is important for the government to embrace the phenomenon of increasingly rapid housing with a variety of consistent management rules that are able to realize Jakarta as a city that has the characteristics of Jakarta socio-cultural ecology. So that workers are able to make continuous improvement to improve the construction of the project [19].

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